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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/547,561	04/12/2000	Gaetan L. Mathieu	P98-US	6320

7590 04/04/2005

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EXAMINER

GILMAN, ALEXANDER

ART UNIT PAPER NUMBER

2833

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/547,561

Applicant(s)

MATHIEU ET AL.

Examiner

Alexander D. Gilman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21, 83-88 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 83-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7, 60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is unclear, why 0.2 percent of linear change of the second element material leads to such a volume transformation (10 percent) that the second material comprises a second volume 90 percent of the first volume of the second element material.(p. 25, lines 15-27).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 8,-15, 18-2183-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Smith (US 5,979,892).

With regard to claims 1-3, 8, Smith et al (US Pat. 5,613,861) disclose (Fig. 6) a system comprising :

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a first substrate (14) with a plurality of first contact nodes (13) formed on the first substrate and a plurality of free-standing resilient interconnection elements (15) electrically contacts a corresponding a corresponding the contact nodes;

a second substrate (101) having a plurality of second contact nodes (3),

wherein the interconnection element (15) comprises:

a first element material adapted to be coupled to a substrate, and

a second different element material adapted to be coupled to the first element material, (col. 4, lines 42-44); and one of the first element material and the second element material comprises a material having a property that the material may be transformed in response to an external stimulus applied to one of the first and second element materials such that upon transformation, a geometrical shape of the interconnection element is irreversibly modified (col.5, lines 3-8) to a shape suitable for use as an interconnection element,

wherein the interconnection element has a portion thereof which is capable to a first position to contact with one of second contact nodes.

Smith et al (US Pat. 5,613,861) does not explicitly disclose that the interconnection element has an overall thickness greater than 1 micron, specifically 25 micronm 28 micron, nd the thickness of the first element being 1-3, 5, 12-25 microns and second element has a thickness 3-6 micron.

Smith (US 5,979,892) disclose (col. 5, lines 30-38) that interconnect formed using microlithography can be formed into almost desired shape and the configuratuion of the interconnect should not construed as limiting invention.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to assign to the interconnect any of the specified configuration, as taught by Smith (US 5,979,892), to achieve the desired elastic and geometrica characteristics.

It was held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA (Patents) 1250, 156 F. 2d 239, 70 USPQ 412.

With regard to claim 4, Smith et al (US Pat. 5,613,861) disclose that the transformable property is such that a first volume is adapted to be transformed to a different second volume.

With regard to claim 5, Smith et al (US Pat. 5,613,861) disclose that the second element material overlies the first ( for example, considering the first element as a non-conductive element, according to col. 4, lines 42-43).

With regard to claims 6, 20, Smith et al (US Pat. 5,613,861) disclose that a transformation of the first and second material element is a result of exposing the first and/or second element to heat (col. 6, lines 36-39, specifically - the thermal evaporation).

With regard to claims 9, 11, Smith et al (US Pat. 5,613,861) disclose the second element is introduced by plating and more specifically electroless plating (col. 6, lines 36-39 and col. 8, lines 61-62).

With regard to claim 10, Smith et al (US Pat. 5,613,861) disclose the second element is introduced by sputtering (col. 6, lines 39-40).

With regard to claims 14, 15, , Smith et al (US Pat. 5,613,861) disclose the second element comprises nickel or nickel alloy (col. 4, lines 44-46).

With regard to claim 18, Smith et al (US Pat. 5,613,861) disclose that transformable property is a stress and transformation reduces the magnitude of the stress of the material (col. 5, lines 19-21).

With regard to claims 19, 21, Smith et al (US Pat. 5,613,861) disclose that the second element material tensile and compressive stress and a deformation is a response to these stresses (col. 5, lines 11-21).

1. Claims 7, is, as it can be understood due to the 112 problem, rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Smith (US 5,979,892).

Smith et al, respectively disclose all of the limitations except for:

the second volume comprises about 90 percent of the first volume of the second element material

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to discover the claimed quantitative characteristics of the transformability volume and percent of spring material in the interconnection element, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Moreover, the specification does not disclose that the specified in claim percent of volume change is critical for the invention (p. 25, lines 18-20).

2. Claims 12, 13, are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Smith (US 5,979,892). and further in view of Eldridge et al.

Smith et al-Smith disclose all of the limitations except for the first element material comprising palladium or its alloy.

Eldridge et al (US Pat. No. 5,832,601) disclose the first element material comprising palladium or its alloy (col. 14, lines 6-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Smith et al interconnection element comprising palladium or its alloy, as taught by Eldridge et al, as an alternative material for the first element.

3. Claims 16, 17, are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Smith (US 5,979,892). and further in view of Faraci et al.

With regard to claims 16, 17, Smith et al (US Pat. 5,613,861) disclose (Fig. 6) a system comprising :

a first substrate (14) with a plurality of first contact nodes (13) formed on the first substrate and a plurality of free-standing resilient interconnection elements (15) electrically contacts a corresponding a corresponding the contact nodes;

a second substrate (101) having a plurality of second contact nodes (3),

wherein the interconnection element (15) comprises:

a first element material adapted to be coupled to a substrate, and

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a second different element material adapted to be coupled to the first element material, (col. 4, lines 42-44); and one of the first element material and the second element material comprises a material having a property that may be transformed in response an external stimulus applied to one of the first and second element materials such that upon transformation, a geometrical shape of the interconnection element is irreversibly modified, (col.5, lines 3-8), wherein the interconnection element has a portion thereof which is capable to a first position to contact with one of second contact nodes.

Smith et al-Smith disclose all of the limitations except for the second element material comprising a shape memory alloy.

Faraci et al (US Pat. No. 5,810,609) disclose the second element material comprising a shape memory alloy (col. 14, lines 6-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Smith et al interconnection element comprising a shape memory alloy, as taught by, Faraci et al, to improve the Smith et al interconnection element elastic qualities..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander D. Gilman whose telephone number is 571 272-2004. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571 272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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03/29/2005

Alexander Gilman

**ALEXANDER GILMAN  
PRIMARY EXAMINER**